

Fig. 1

4 x 4 HADAMARD'S MATRIX (A)

L=1	1	1	1	1
L=2	1	-1	1	-1
L=3	1	1	-1	-1
L=4	1	-1	-1	1

Fig. 2

COLUMN ELECTRODE 1

VECTOR (d) $(-1 \ -1 \ -1 \ -1)$ VECTOR (v) $(-4 \ 0 \ 0 \ 0)$

COLUMN ELECTRODE 2

VECTOR (d) $(-1 \ 1 \ 1 \ 1)$ VECTOR (v) $(2 \ -2 \ -2 \ -2)$ *Fig . 3*

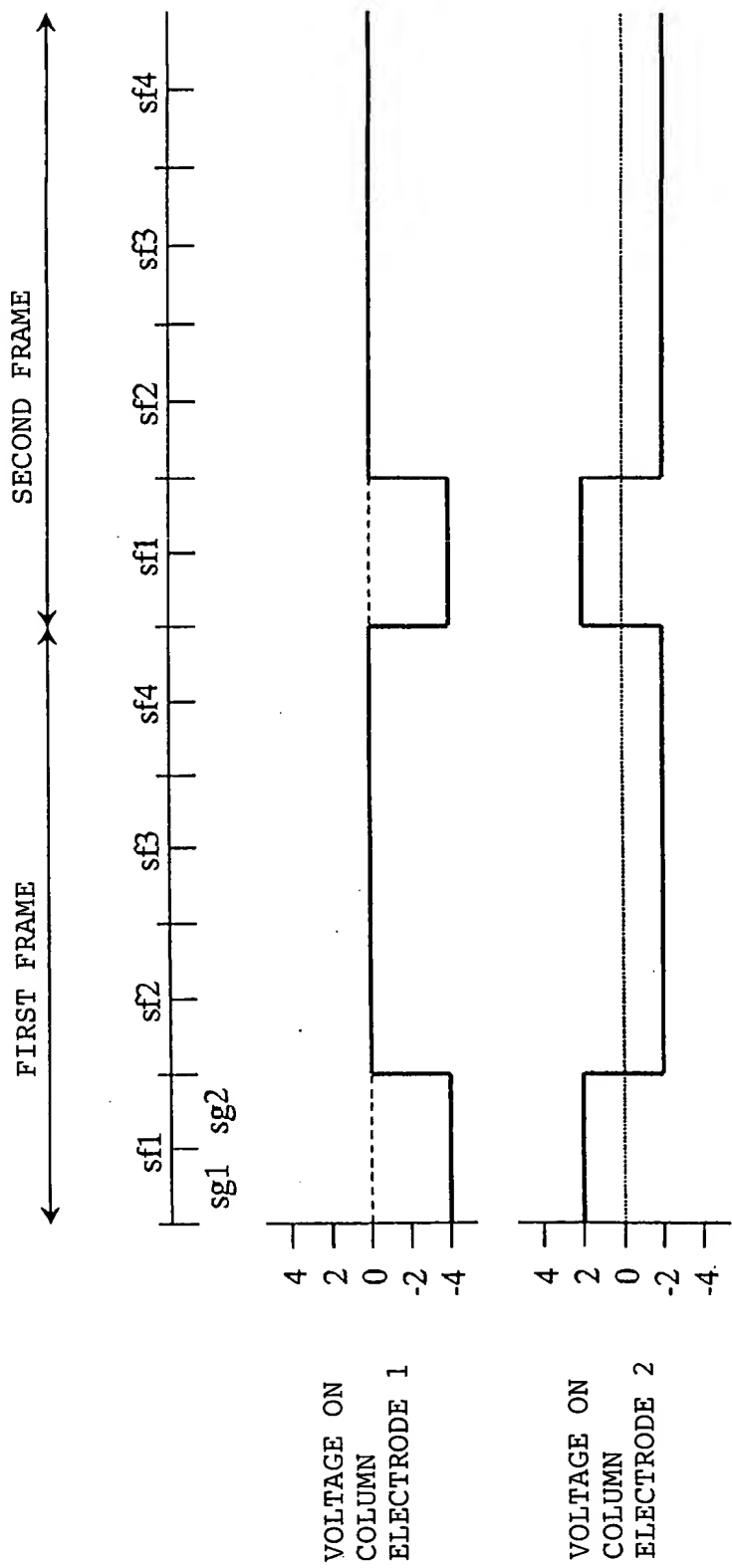


Fig. 4

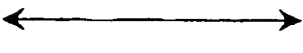

GRADATION LEVEL	SELECTION PERIOD OF FIRST FRAME		SELECTION PERIOD OF SECOND FRAME	
				
	T1	T0	T1	T0
6/6	1	1	1	1
5/6	1	1	1	0
4/6	1	1	0	1
3/6	1	1	0	0
2/6	1	0	0	0
1/6	0	1	0	0
0/6	0	0	0	0

Fig. 5

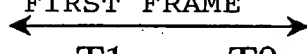
	SELECTION PERIOD OF FIRST FRAME	
		
	T1	T0
L1 (3/6)	1	1
L2 (2/6)	1	0
L3 (1/6)	0	1
L4 (0/6)	0	0

Fig. 6

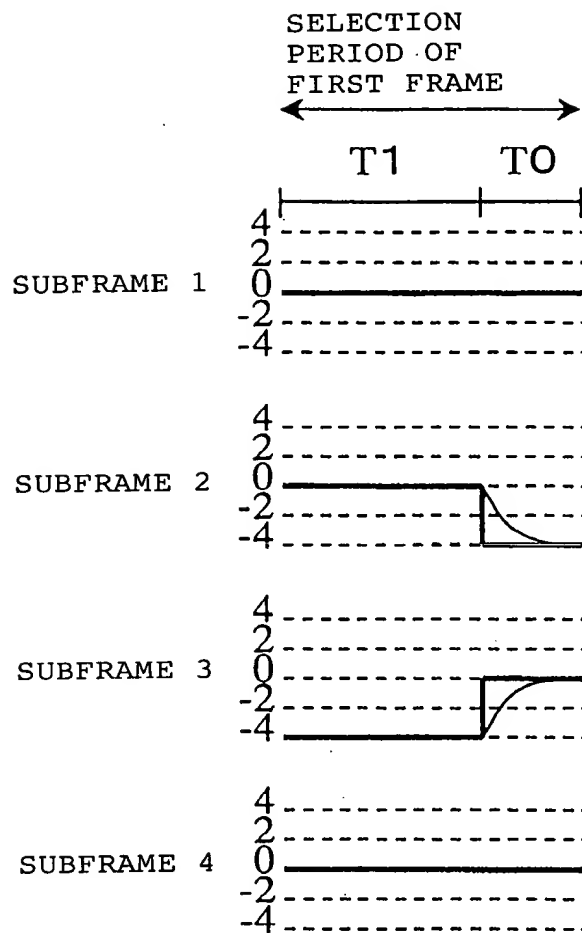


Fig. 7

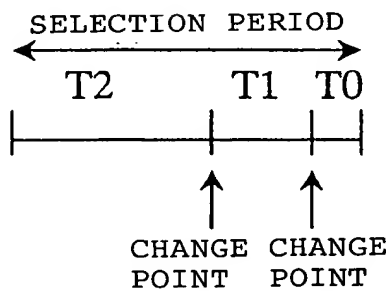


Fig. 8

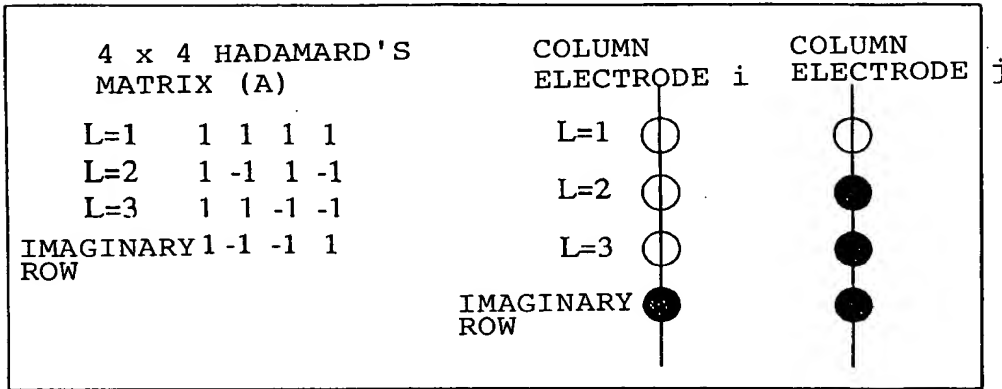


Fig. 9A

COLUMN ELECTRODE i	
VECTOR (d)	(-1 -1 -1 1)
VECTOR (v)	(-2 -2 -2 2)
COLUMN ELECTRODE j	
VECTOR (d)	(-1 1 1 1)
VECTOR (v)	(2 -2 -2 -2)

Fig. 9B

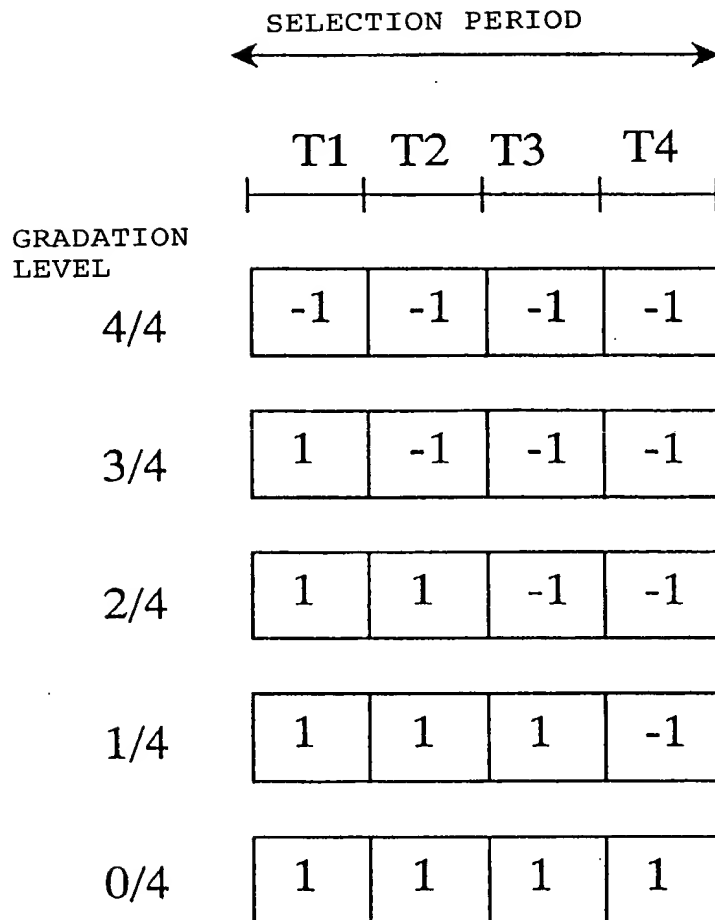
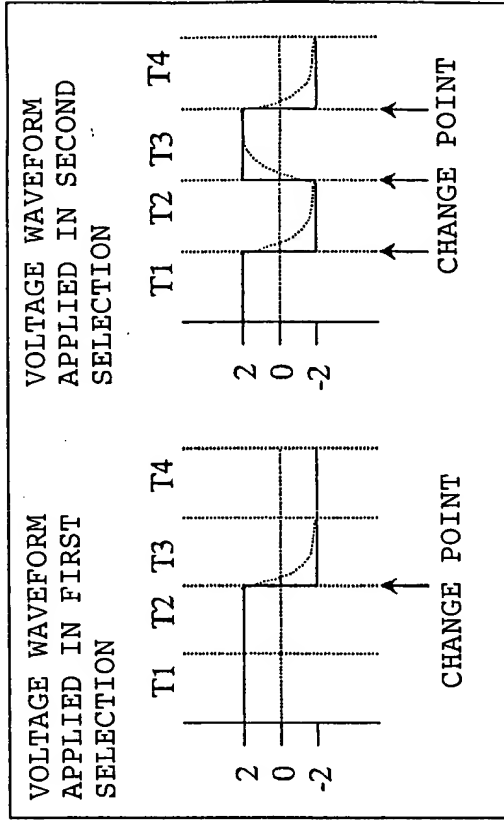


Fig. 10

	T1	T2	T3	T4
L1 (3/4 GRADATION LEVEL)	1	-1	-1	-1
L2 (2/4 GRADATION LEVEL)	1	1	-1	-1
L3 (1/4 GRADATION LEVEL)	1	1	1	-1
IMAGINARY ROW	-1	1	-1	1

	T1	T2	T3	T4
FIRST SELECTION	2	2	-2	-2
SECOND SELECTION	2	-2	2	-2
THIRD SELECTION	2	-2	-2	-2
FOURTH SELECTION	-2	-2	-2	2



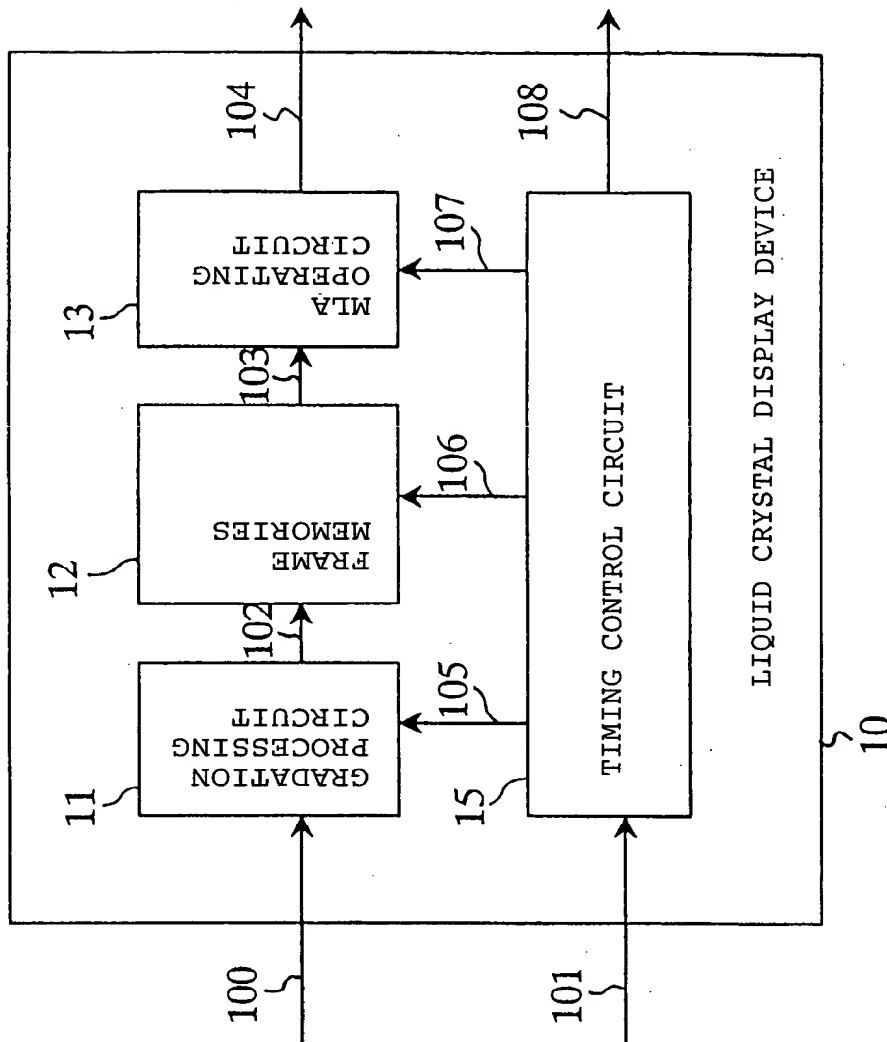


Fig. 12

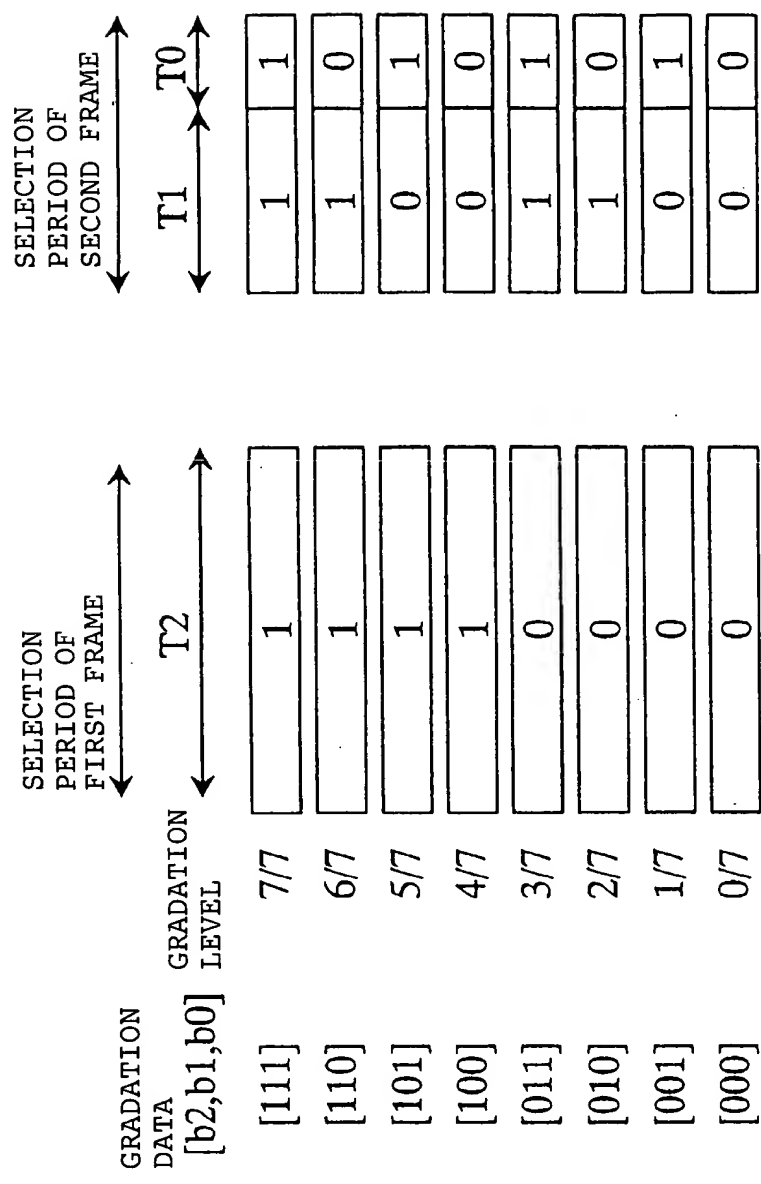
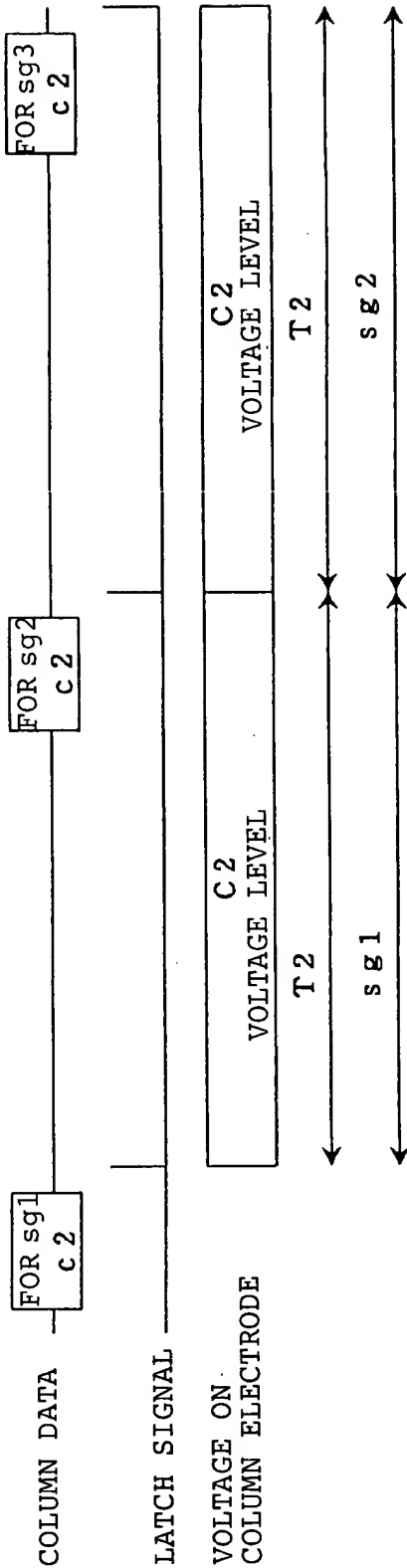


Fig. 13

(TIMING OF LATCH SIGNAL IN FIRST FRAME)



(TIMING OF LATCH SIGNAL IN SECOND FRAME)

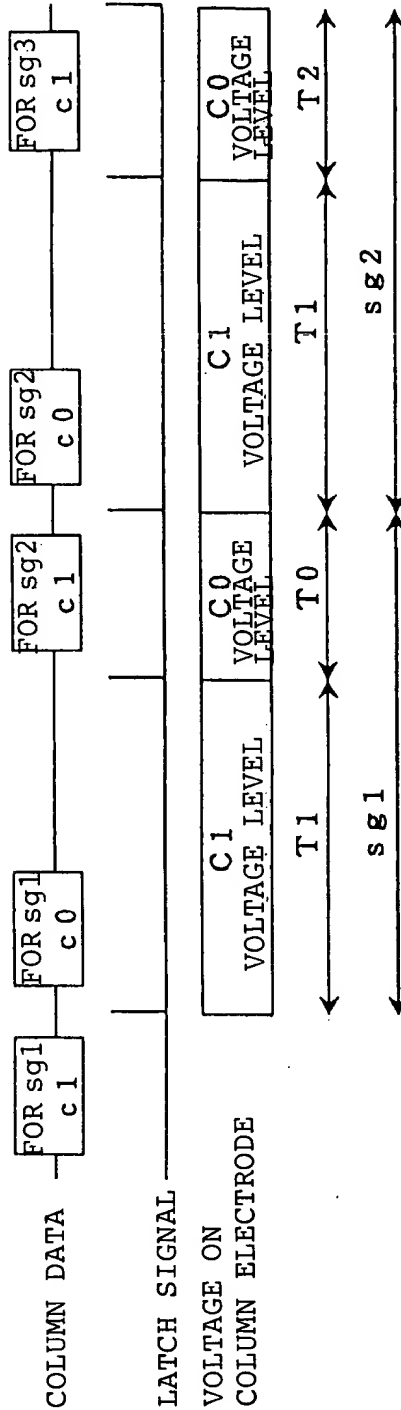


Fig. 14

GRADATION DATA [b2,b1,b0]	GRADATION LEVEL	SELECTION PERIOD OF FIRST FRAME			SELECTION PERIOD OF SECOND FRAME		
		T3		T0	T2		T1
[1111]	15/15	1		1	1		1
[1100]	14/15	1		0	1		1
[1101]	13/15	1		1	1		0
[1100]	12/15	1		0	1		0
[1011]	11/15	1		1	0		1
[1010]	10/15	1		0	0		1
[1001]	9/15	1		1	0		0
[1000]	8/15	1		0	0		0
[0111]	7/15	0		1	1		1
[0110]	6/15	0		0	1		1
[0101]	5/15	0		1	1		0
[0100]	4/15	0		0	1		0
[0011]	3/15	0		1	0		1
[0010]	2/15	0		0	0		1
[0001]	1/15	0		1	0		0
[0000]	0/15	0		0	0		0

Fig. 15

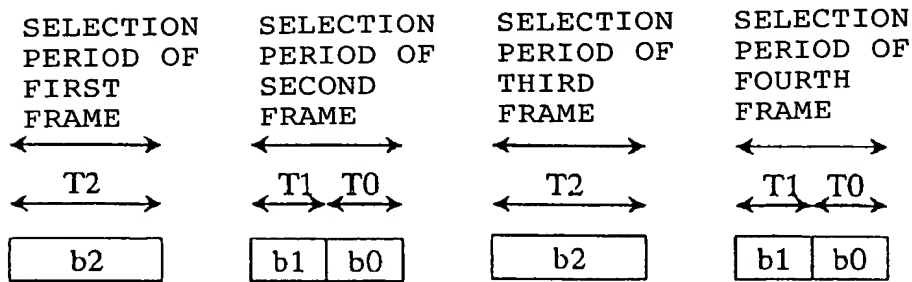


Fig. 16

GRADATION NUMBER	f1	f2			f3	f4			GRADATION LEVEL
	T2	T1	T0	T2	T1	T0			
0	0	0	0	0	0	0	0	0 /20	
1	0	0	1	0	0	0	0	1 /20	
2	0	0	1	0	0	0	1	2 /20	
3	0	1	0	0	0	0	0	3 /20	
4	0	1	1	0	0	0	0	4 /20	
5	0	1	1	0	0	0	1	5 /20	
6	1	0	0	0	0	0	0	6 /20	
7	1	0	1	0	0	0	0	7 /20	
8	1	0	1	0	0	0	1	8 /20	
9	1	1	0	0	0	0	0	9 /20	
10	1	1	1	0	0	0	0	10 /20	
11	1	1	1	0	0	0	1	11 /20	
12	1	1	0	0	1	0	0	12 /20	
13	1	1	1	0	1	0	0	13 /20	
14	1	1	1	0	1	1	1	14 /20	
15	1	1	0	1	0	0	0	15 /20	
16	1	1	1	1	0	0	0	16 /20	
17	1	1	1	1	0	1	1	17 /20	
18	1	1	0	1	1	0	0	18 /20	
19	1	1	1	1	1	1	0	19 /20	
20	1	1	1	1	1	1	1	20 /20	

Fig. 17

GRADATION NUMBER	f1	f2		f3	f4		GRADTION LEVEL
	T2	T1	T0	T2	T1	T0	
0	0	0	0	0	0	0	0 / 20
1	0	0	1	0	0	0	2 / 20
2	0	1	0	0	0	0	3 / 20
3	0	0	1	0	0	1	4 / 20
4	0	1	1	0	0	0	5 / 20
5	1	0	0	0	0	0	6 / 20
6	0	1	1	0	0	1	7 / 20
7	1	0	1	0	0	0	8 / 20
8	1	1	0	0	0	0	9 / 20
9	1	0	1	0	0	1	10 / 20
10	1	1	1	0	0	0	11 / 20
11	1	1	0	0	1	0	12 / 20
12	1	1	1	0	0	1	13 / 20
13	1	1	1	0	1	0	14 / 20
14	1	1	0	1	0	0	15 / 20
15	1	1	1	0	1	1	16 / 20
16	1	1	1	1	0	0	17 / 20
17	1	1	0	1	1	0	18 / 20
18	1	1	1	1	0	1	19 / 20
19	1	1	1	1	1	0	20 / 20
20	1	1	1	1	1	1	22 / 20

Fig. 18

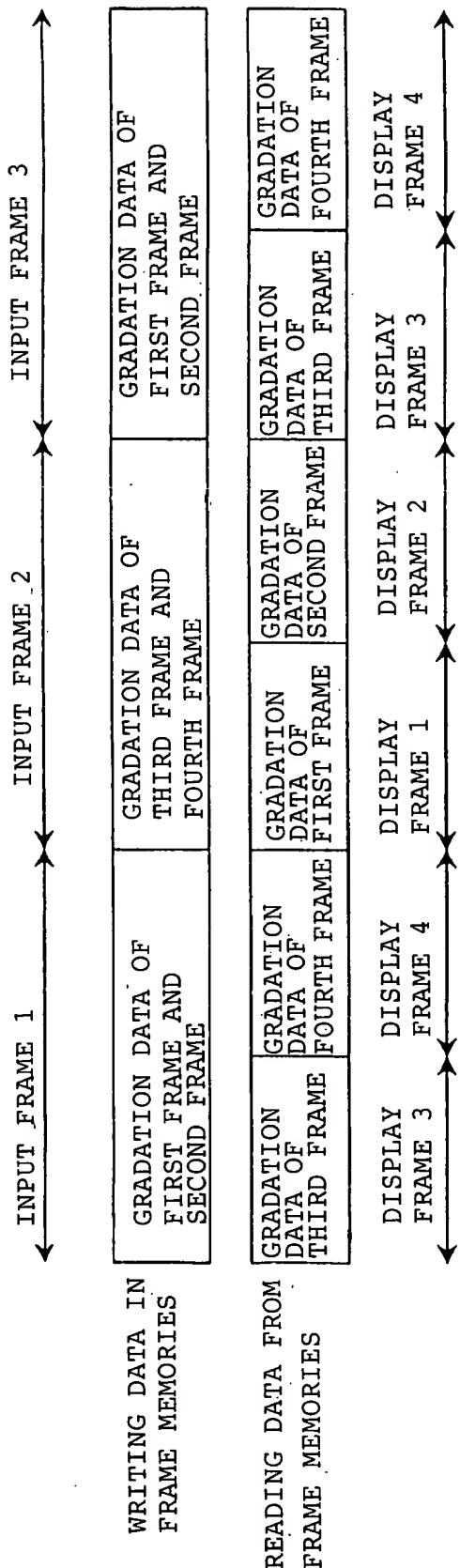
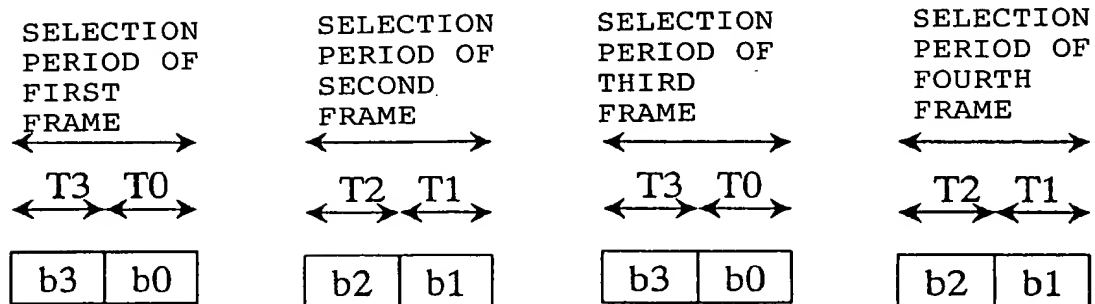


Fig. 19

*Fig. 20*

GRADATION NUMBER	f1		f2		f3		f4		GRADATION LEVEL
	T 3	T 0	T 2	T 1	T 3	T 0	T 2	T 1	
0	0	0	0	0	0	0	0	0	0 / 44
1	0	1	0	0	0	0	0	0	1 / 44
2	0	1	0	0	0	1	0	0	2 / 44
3	0	0	0	1	0	0	0	0	3 / 44
4	0	1	0	1	0	0	0	0	4 / 44
5	0	1	0	1	0	1	0	0	5 / 44
6	0	0	1	0	0	0	0	0	6 / 44
7	0	1	1	0	0	0	0	0	7 / 44
8	0	1	1	0	0	1	0	0	8 / 44
9	0	0	1	1	0	0	0	0	9 / 44
10	0	1	1	1	0	0	0	0	10 / 44
11	0	1	1	1	0	1	0	0	11 / 44
12	1	0	0	0	0	0	0	0	12 / 44
13	1	1	0	0	0	0	0	0	13 / 44
14	1	1	0	0	0	1	0	0	14 / 44
15	1	0	0	1	0	0	0	0	15 / 44
16	1	1	0	1	0	0	0	0	16 / 44
17	1	1	0	1	0	1	0	0	17 / 44
18	1	0	1	0	0	0	0	0	18 / 44
19	1	1	1	0	0	0	0	0	19 / 44
20	1	1	1	0	0	1	0	0	20 / 44
21	1	0	1	1	0	0	0	0	21 / 44
22	1	1	1	1	0	0	0	0	22 / 44
23	1	1	1	1	0	1	0	0	23 / 44
24	1	0	1	1	0	0	0	1	24 / 44
25	1	1	1	1	0	0	0	1	25 / 44
26	1	1	1	1	0	1	0	1	26 / 44
27	1	0	1	1	0	0	1	0	27 / 44
28	1	1	1	1	0	0	1	0	28 / 44
29	1	1	1	1	0	1	1	0	29 / 44
30	1	0	1	1	0	0	1	1	30 / 44
31	1	1	1	1	0	0	1	1	31 / 44
32	1	1	1	1	0	1	1	1	32 / 44
33	1	0	1	1	1	0	0	0	33 / 44
34	1	1	1	1	1	0	0	0	34 / 44
35	1	1	1	1	1	1	0	0	35 / 44
36	1	0	1	1	1	0	0	1	36 / 44
37	1	1	1	1	1	0	0	1	37 / 44
38	1	1	1	1	1	1	0	1	38 / 44
39	1	0	1	1	1	0	1	0	39 / 44
40	1	1	1	1	1	0	1	0	40 / 44
41	1	1	1	1	1	1	1	0	41 / 44
42	1	0	1	1	1	0	1	1	42 / 44
43	1	1	1	1	1	0	1	1	43 / 44
44	1	1	1	1	1	1	1	1	44 / 44

Fig. 21

GRADATION NUMBER	f1		f2		f3		f4		GRADATION LEVEL
	T 3	T 0	T 2	T 1	T 3	T 0	T 2	T 1	
0	0	0	0	0	0	0	0	0	0 / 46
1	0	1	0	0	0	0	0	0	2 / 46
2	0	0	0	1	0	0	0	0	3 / 46
3	0	1	0	0	0	1	0	0	4 / 46
4	0	1	0	1	0	0	0	0	5 / 46
5	0	0	1	0	0	0	0	0	6 / 46
6	0	1	0	1	0	1	0	0	7 / 46
7	0	1	1	0	0	0	0	0	8 / 46
8	0	0	1	1	0	0	0	0	9 / 46
9	0	1	1	0	0	1	0	0	10 / 46
10	0	1	1	1	0	0	0	0	11 / 46
11	1	0	0	0	0	0	0	0	12 / 46
12	0	1	1	1	0	1	0	0	13 / 46
13	1	1	0	0	0	0	0	0	14 / 46
14	1	0	0	1	0	0	0	0	15 / 46
15	1	1	0	0	0	1	0	0	16 / 46
16	1	1	0	1	0	0	0	0	17 / 46
17	1	0	1	0	0	0	0	0	18 / 46
18	1	1	0	1	0	1	0	0	19 / 46
19	1	1	1	0	0	0	0	0	20 / 46
20	1	0	1	1	0	0	0	0	21 / 46
21	1	1	1	0	0	1	0	0	22 / 46
22	1	1	1	1	0	0	0	0	23 / 46
23	1	0	1	1	0	0	0	1	24 / 46
24	1	1	1	1	0	1	0	0	25 / 46
25	1	1	1	1	0	0	0	1	26 / 46
26	1	0	1	1	0	0	1	0	27 / 46
27	1	1	1	1	0	1	0	1	28 / 46
28	1	1	1	1	0	0	1	0	29 / 46
29	1	0	1	1	0	0	1	1	30 / 46
30	1	1	1	1	0	1	1	0	31 / 46
31	1	1	1	1	0	0	1	1	32 / 46
32	1	0	1	1	1	0	0	0	33 / 46
33	1	1	1	1	0	1	1	1	34 / 46
34	1	1	1	1	1	0	0	0	35 / 46
35	1	0	1	1	1	0	0	1	36 / 46
36	1	1	1	1	1	1	0	0	37 / 46
37	1	1	1	1	1	0	0	1	38 / 46
38	1	0	1	1	1	0	1	0	39 / 46
39	1	1	1	1	1	1	0	1	40 / 46
40	1	1	1	1	1	0	1	0	41 / 46
41	1	0	1	1	1	0	1	1	42 / 46
42	1	1	1	1	1	1	1	0	43 / 46
43	1	1	1	1	1	0	1	1	44 / 46
44	1	1	1	1	1	1	1	1	46 / 46

Fig. 22

EXAMPLE	TIME RATIO
1	4 : 3 (75%)
2	9 : 6 (67%)
3	6 : 4 OR 6 : 5 (67% OR 83%)
4	13 : 9 OR 14 : 9 (69% OR 64%)

Fig. 23

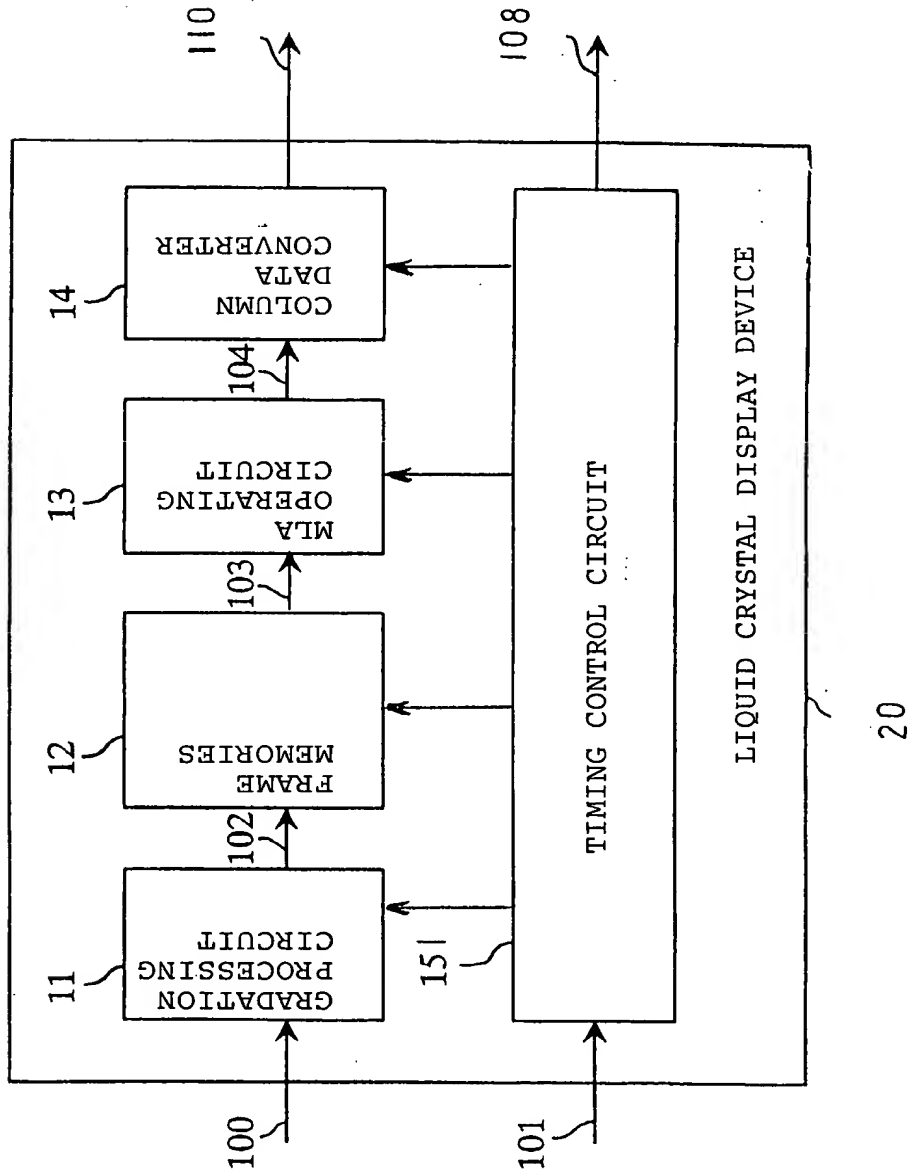


Fig. 24

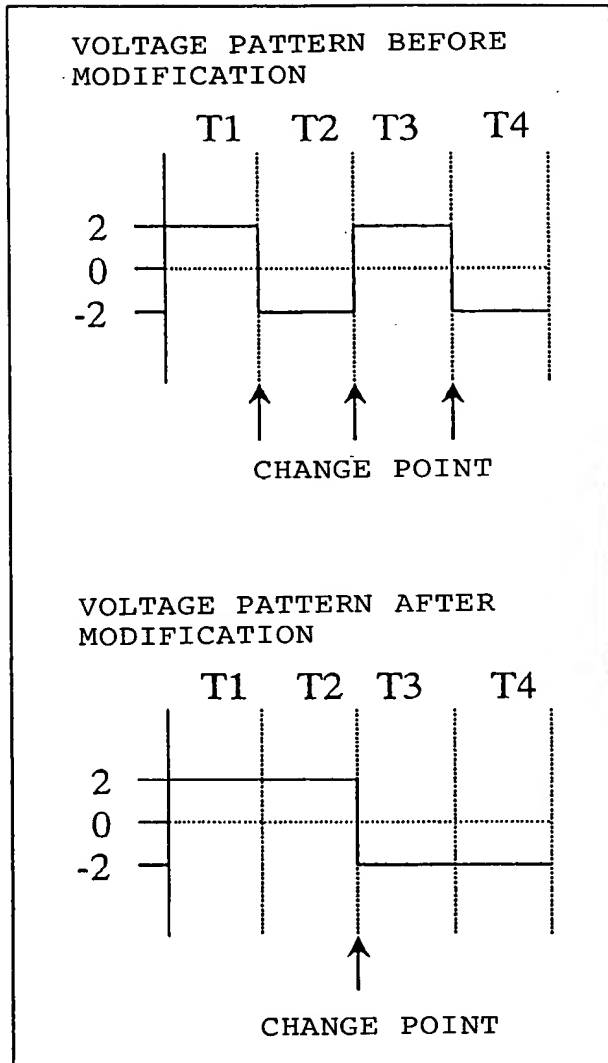


Fig. 25

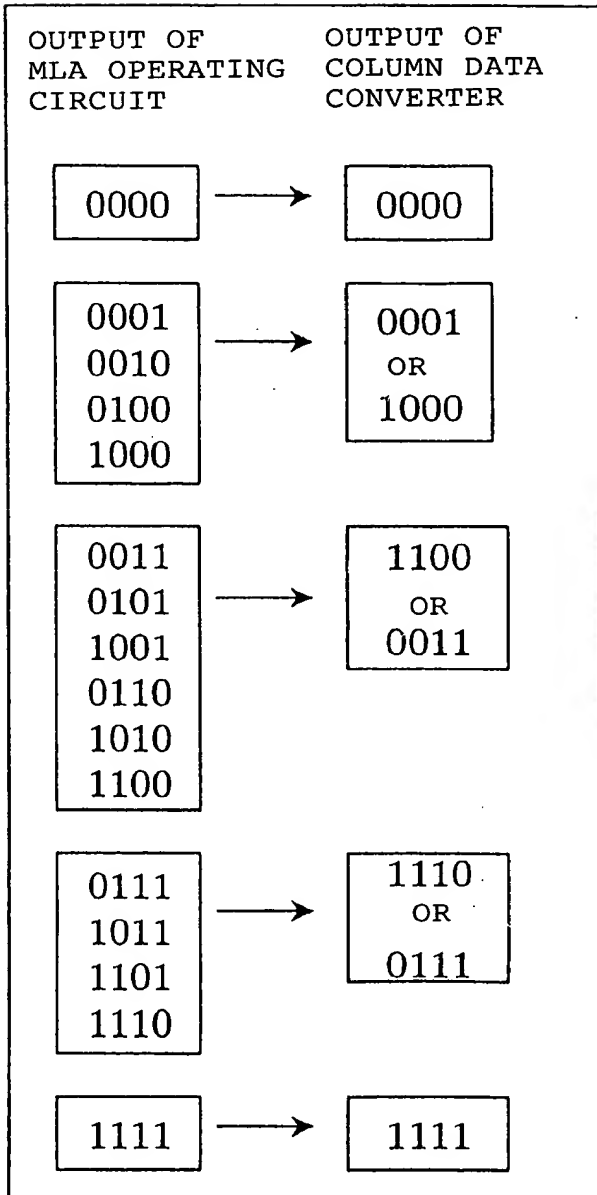


Fig. 26

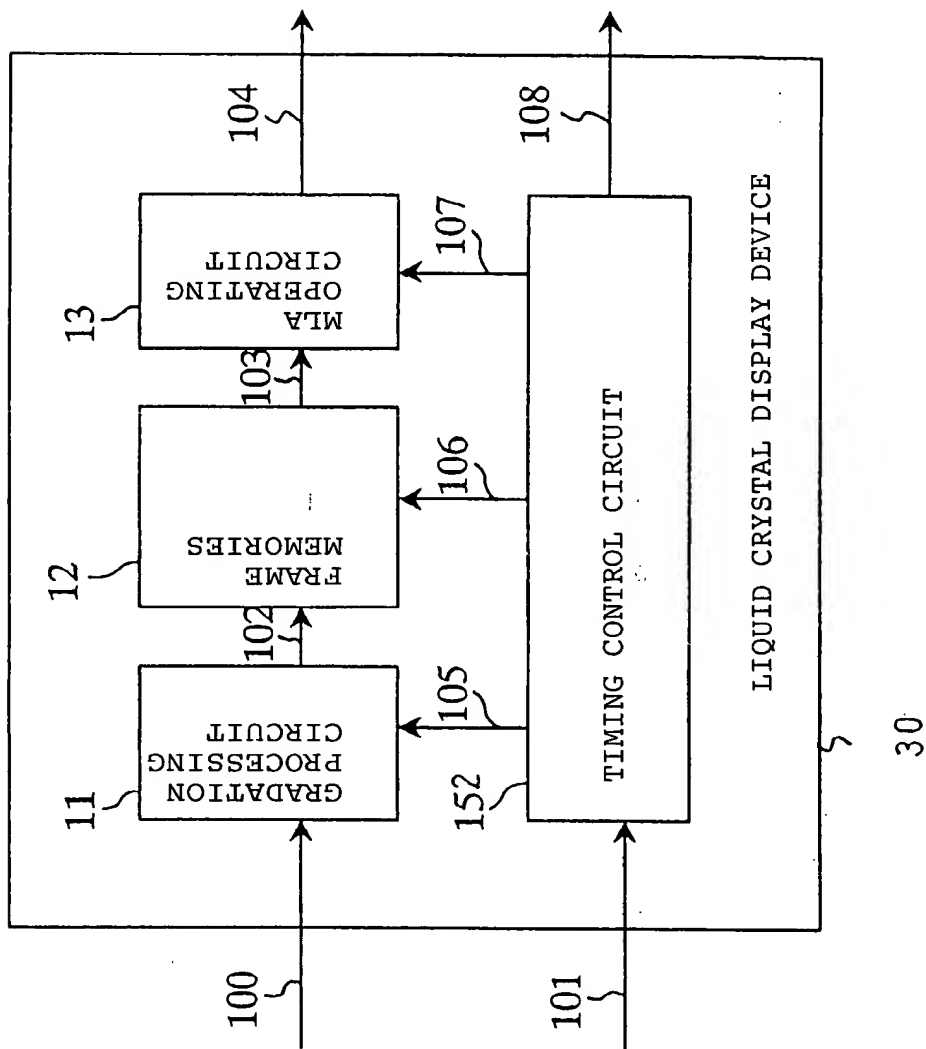
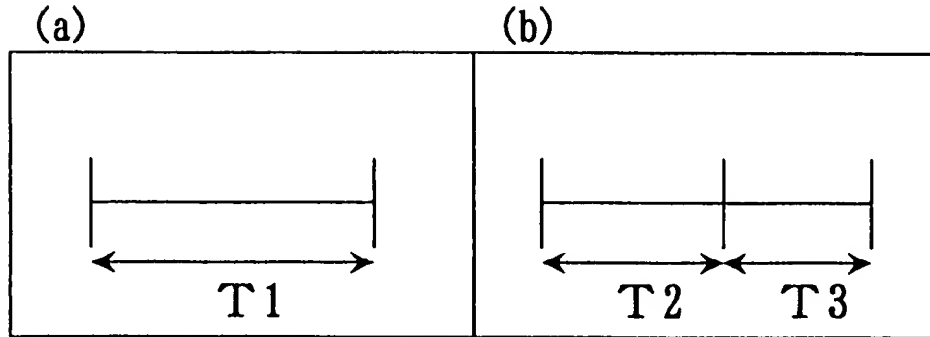


Fig. 27



$$T1 : T2 : T3 = 4 : 3 : 2$$

Fig. 28

VOLTAGE LEVEL	T1	T2	T3	Vrms
0	0	0	0	0.91
2	0	0	1	0.93
3	0	1	0	0.94
4	1	0	0	0.95
5	0	1	1	0.96
6	1	0	1	0.97
7	1	1	0	0.98
9	1	1	1	1

Vrms: STANDARDIZED BASED ON ON

Fig. 29

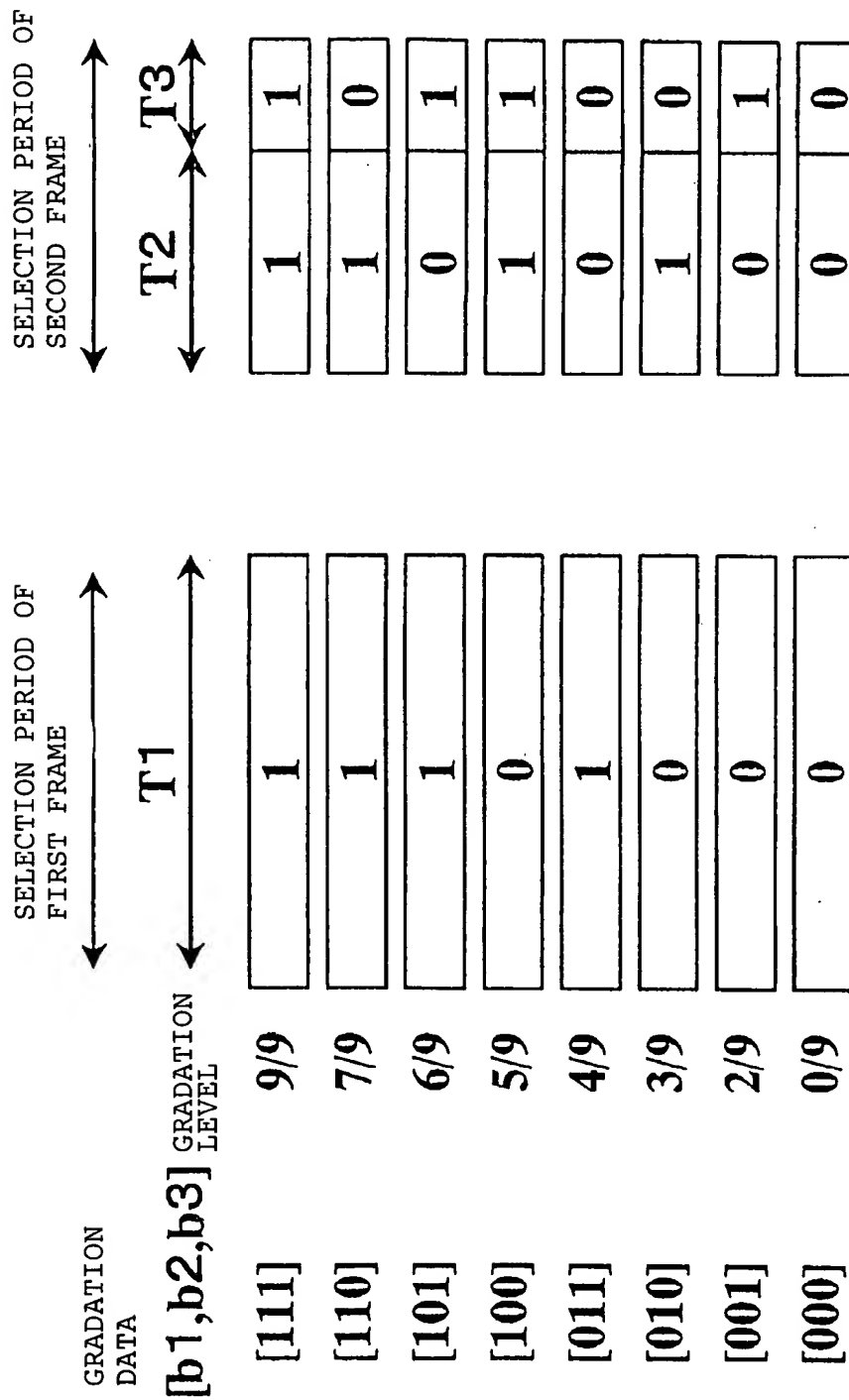
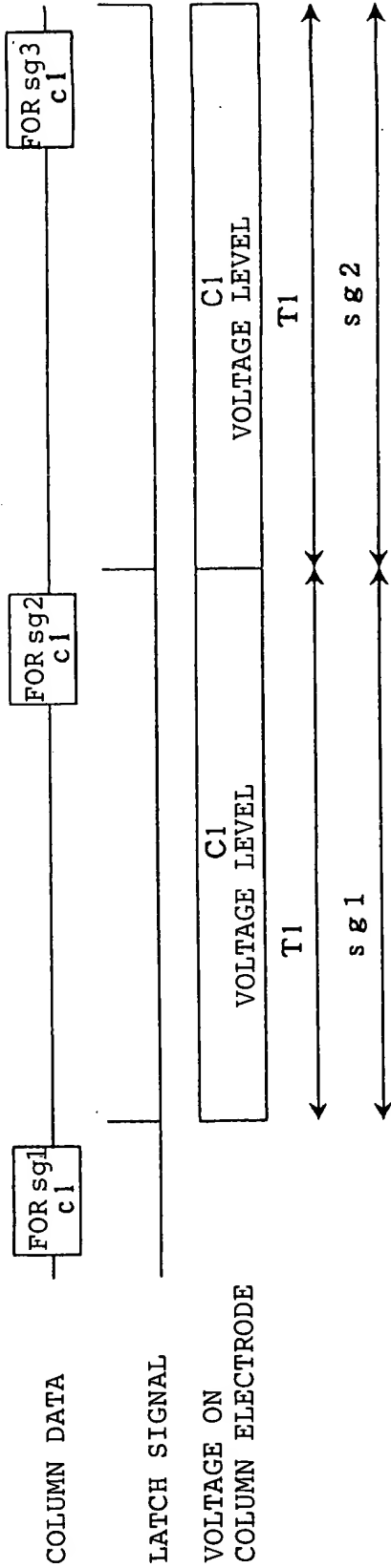


Fig. 30

(TIMING OF LATCH SIGNAL IN FIRST FRAME)



(TIMING OF LATCH SIGNAL IN SECOND FRAME)

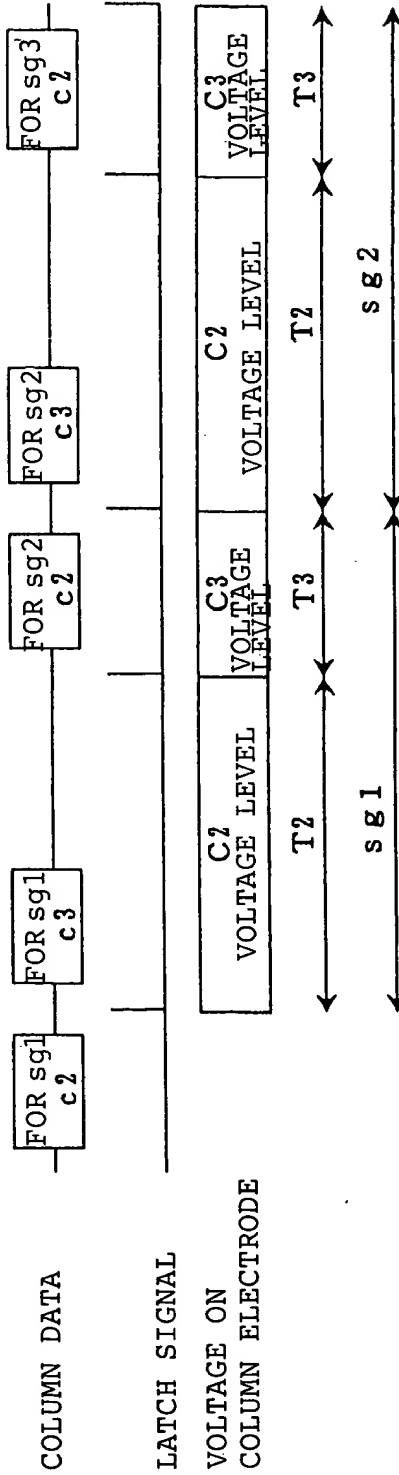
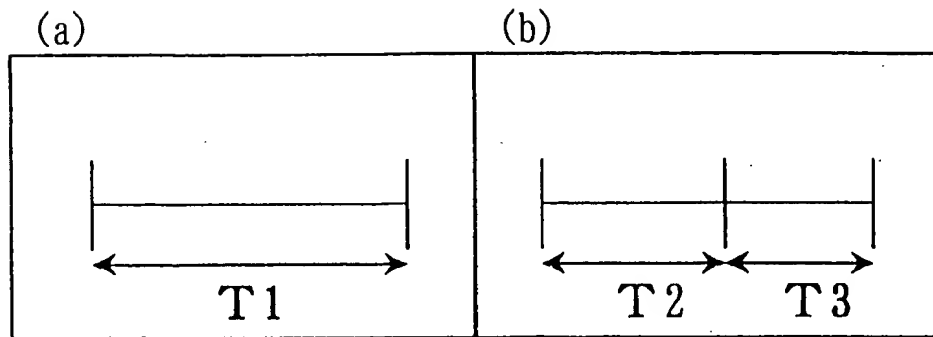


Fig. 31



$$T1:T2:T3=5:3:2$$

Fig. 32

VOLTAGE LEVEL	T1	T2	T1	T2
0	0	0	0	0
2	0	0	1	0
3	0	0	0	1
4	1	0	1	0
5	0	0	1	1
6	0	1	0	1
7	1	0	1	1
8	0	1	1	1
10	1	1	1	1

$$T1:T2=2:3$$

Fig. 33

	T1	T2	T3	T1	T1	T3
19	1	0	1	1	1	1
20	1	1	0	1	1	1
22	1	1	1	1	1	1

	T1	T2	T3	T1	T2	T3
0	0	0	0	0	0	0
2	0	0	0	0	0	1
3	0	0	0	0	1	0
4	0	0	1	0	0	1
5	0	0	0	0	1	1
6	0	0	0	1	0	0
7	0	0	1	0	1	1
8	0	0	0	1	0	1
9	0	0	0	1	1	0
10	0	0	1	1	0	1
11	0	0	0	1	1	1
12	0	1	0	1	1	0
13	0	0	1	1	1	1
14	0	1	0	1	1	1
15	1	0	0	1	1	0
16	0	1	1	1	1	1
17	1	0	0	1	1	1
18	1	1	0	1	1	0

T1:T2:T3=6:3:2

Fig. 34

(a)		(b)
0		0
2		
3		1
4		
5		2
6		
7		3
8		4
9		5
10		6
11		7
12		8
13		9
14		10
15		11
16		12
17		
18		13
19		
20		14
22		15

Fig. 35

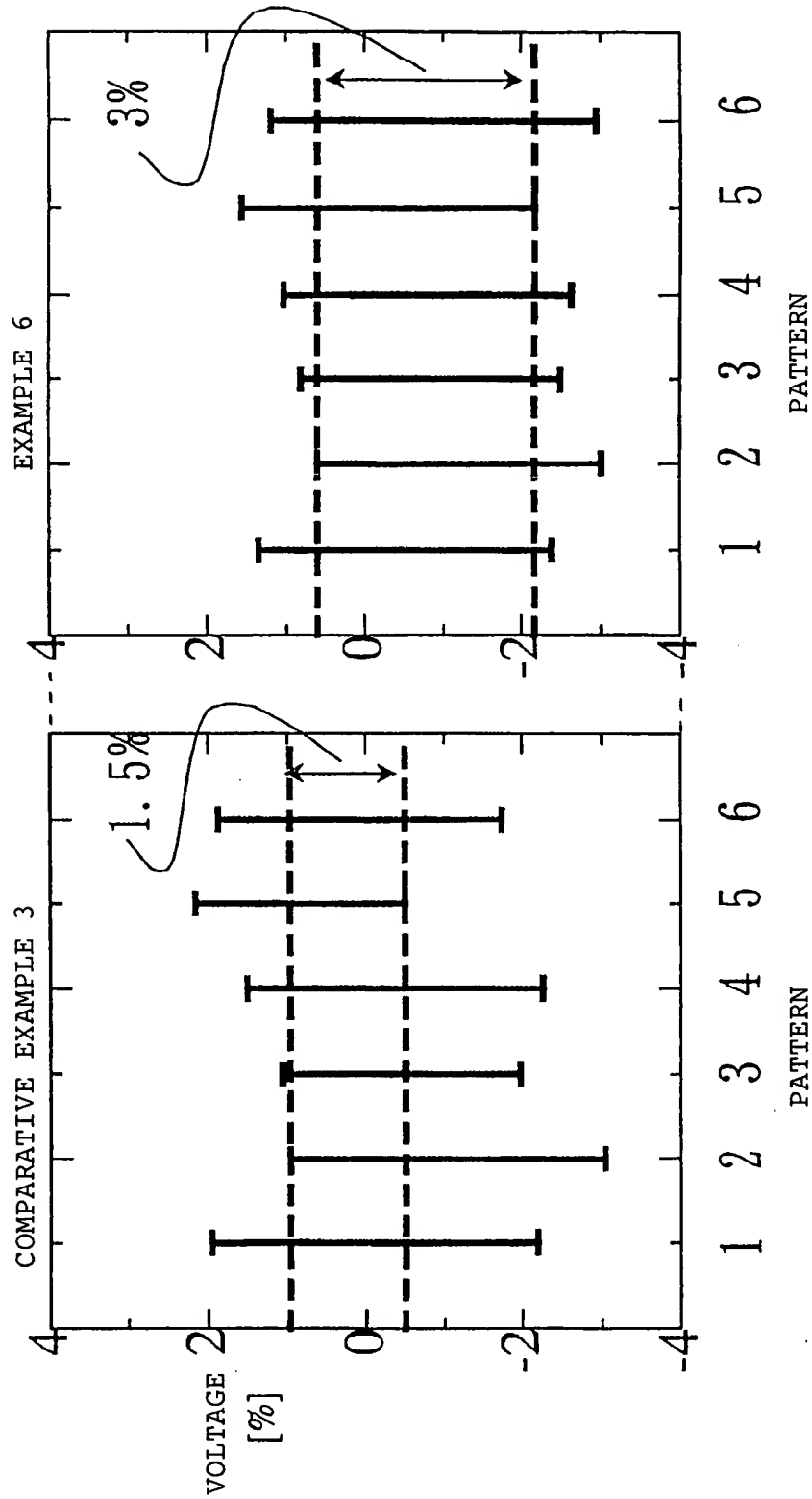
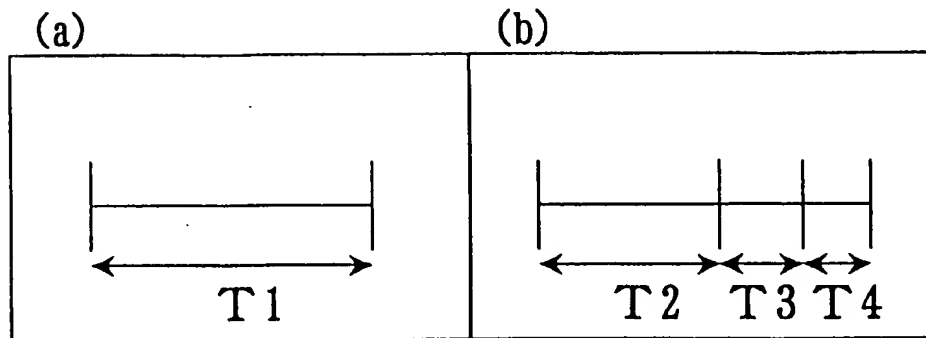


Fig. 36

IMAGE NUMBER	TITLE	CONTENTS
1	BIKE RACING	AN IMAGE OF A MOTOR BIKE FOR RACING WHICH IS COLORED WITH WHITE AND RED AS BASIC COLORS, THE MOTOR BIKE BEING CONTRASTED WITH A COLOR FOR THE GROUND
2	NIGHT SCENE	AN IMAGE OF THE DARKEST SCENE
3	ALPS	A SCENE OF A SNOW MOUNTAIN IN A BLUE SKY
4	AIRPLANE	AN IMAGE OF A RELATIVELY BRIGHT OBJECT
5	RAIL COASTER	AN IMAGE OF A RAIL COASTER IN A BACKGROUND OF CLOUD
6	LABORATORY	AN IMAGE OF A MAN IN A DARK ROOM

Fig. 37



$$T1:T2:T3:T4=12:6:3:2$$

Fig. 38

(a)		(b)	
0	24	0	16
2	25		17
3	26	1	18
4	27		19
5	28		20
6	29	2	21
7	30		22
8	31		23
9	32	3	24
10	33		25
11	34	4	26
12	35		27
13	36	5	
14	37	6	28
15	38	7	
16	39	8	
17	40	9	29
18	41	10	
19	42	11	
20	43	12	30
21	44	13	
22	46	14	31
23		15	

Fig. 39

(TIME RATIO)

	1	2	4	8
0	0	0	0	0
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
10	0	1	0	1
11	1	1	0	1
12	0	0	1	1
13	1	0	1	1
14	0	1	1	1
15	1	1	1	1

VOLTAGE LEVEL

(VOLTAGE LEVEL)	(GRADATION LEVEL)
0 16 32 48	0 18
1 17 33 49	3 19
2 18 34 50	4 20 30
3 19 35 51	5 21
4 20 36 52	6 22
5 21 37 53	7 23
6 22 38 54	8 24
7 23 39 55	9 25
8 24 40 56	10 26
9 25 41 57	11 27
10 26 42 58	12 28
11 27 43 59	13
12 28 44 60	14 29 31
13 29 45 61	15
14 30 46 62	2 16
15 31 47 63	17



1

Fig. 40B

Fig. 40A

(VOLTAGE LEVEL)	(GRADATION LEVEL)
0 16 32 48	0 6 16 27
1 17 33 49	17
2 18 34 50	7 18 28
3 19 35 51	19
4 20 36 52	1 8 20
5 21 37 53	21 29
6 22 38 54	9 22
7 23 39 55	2
8 24 40 56	10 23 30
9 25 41 57	
10 26 42 58	3 11 24
11 27 43 59	
12 28 44 60	4 12 25 31
13 29 45 61	13
14 30 46 62	5 14 26
15 31 47 63	15



Fig. 41